

niferous ether; but when we have a thing elastic like jelly and yielding like pitch, surely we have a large and solid ground for our faith in the speculative hypothesis of an elastic luminiferous ether, which constitutes the wave theory of light.

SCIENTIFIC SERIALS

Bulletin de la Société de Géographie, Paris, 3 Trimestre, 1884.—The principal portion of this number is occupied by papers of M. Huber, who spent the years 1878 to 1882 in Arabia on a scientific mission on behalf of the Department of Public Instruction. In the first he introduces 145 inscriptions which he found in various parts of Central Arabia on rocks. The second article is the first instalment (accompanied by a map) of an account of his numerous and extensive journeys in the same region, from Palmyra and Bagdad in the north, to Kheiber in the south. A glance at the route map shows that he has explored the greater part of this region during his prolonged stay there.—M. Petitin, in his account of his journey in Indo-China, gives a lengthy description of the difficulties and dangers which the traveller encounters in this peninsula. He was selected by Admiral de la Grandière when Governor of Saigon to make a geological investigation of Cochin-China, Siam, Hainan, and Formosa, but the death of the governor and the appointment of another whose views were different cut M. Petitin's explorations short. He saw enough, however, to give a brief account of the geology of Cochin-China, and to give the intending traveller much advice as to his arrangements and preparations. He also urges his countrymen to extend their dominion in the Indo-Chinese peninsula, especially in Tonquin, where the Red River affords them an opening into the heart of China.—M. la Mesle's paper on the eastern provinces of Australia is little more than a lively account of a journey in Queensland, while the object of M. Simonin's article on the ports of Great Britain—especially London, Liverpool, and Glasgow—is not quite apparent, unless it be to urge his countrymen to go and do likewise with their ports.

Verhandlungen der Gesellschaft für Erakunde zu Berlin, Band xi., Nos. 6 and 7.—Herr Müller-Beeck, in the trade of Further India deals largely with trade routes into the Shan States and China. The Songkoi route into Yunnan he regards as one of great difficulty on account of the rapids. The delta also is constantly extending. Hanoi is now 110 miles from the sea; in the seventeenth century it was only half that distance. For half the year the upper part of the river is only navigable for boats of four tons, and when Manhao is reached, there is still a difficult land journey to Yunnan. The population also, he thinks, will form a grave obstacle to any regular trade by this channel.—Herr Buchta, in the Soudan and the Mahdi, deals purely with the political side of the Soudan question.—Prof. Seelstrang gives much interesting geographical and statistical information about the province of Santa Fé, in the Argentine Republic.—The usual notices of other societies and of new books conclude the number.

SOCIETIES AND ACADEMIES

LONDON

Linnean Society, November 20.—Prof. P. Martin Duncan, F.R.S., Vice-President, in the chair.—Mr. A. Roope Hunt was elected a Fellow.—Mr. F. B. Forbes drew attention to specimens of pods and seeds used by the Chinese in place of soap. He stated that for ordinary detergent purposes an impure earthy soda and a lye made from ashes are employed. The leaves of *Hibiscus syriacus* and *Ginkgo biloba* are occasionally used for cleansing the head. The most favourite substance, however, is the fruit of certain Leguminosæ (Fei-tsao-tow). The late Daniel Hanbury figures these seeds as a species of *Dialium*. Dr. Porter Smith says they are the product of the *Acacia concinna* (*Mimosa saponaria*, Roxb.). Dr. Breitschneider asserts, on the contrary, that they belong to *Gymnocladus chinensis*, originally described by Baillon from pods only. Specimens at Kew lately figured in the "Icones Plantarum," are young leaves, fruit, and flowers from Foochow; those now exhibited (by Mr. Forbes) are, however, much finer examples from Ningpo and Wahu. The pods are roasted and kneaded into small balls used for washing clothes, and the head in bathing, but, on account of their unpleasant smell, they are prohibited in the public baths. The pods of *Gleditschia sinensis*, Lamk. (Tsao-chio) are used for the same pur-

poses as *Gymnocladus*, those shown at the meeting being from Peking and Shanghai district. One appears to answer to Dr. Hance's new *G. xylocarpa*. Bentham refers a South China tree to *G. sinensis*. Lamarck founded his species on a tree growing in the Jardin des Plantes, raised from seeds sent by Père Incarville 200 years ago from Peking. It is doubtful if the northern and southern plants are identical. The pods are broken into small bits soaked in boiling water until an oily substance is floated, when they are ready for use. Another saponaceous substance is derived from *Sapindus makarosi* (the *S. chinensis* or *Kolruteria paniculata*, Lam.), specimens of which were shown from Ningpo.—Messrs. H. and J. Groves exhibited specimens of (1) *Chara connivens*, collected at Slapton, South Devon, the only known British station, for no trace of the plant is now to be found at Stokes Bay; (2) *Chara canescens*, obtained from a pool between Helston and the Lizard, West Cornwall, by Messrs. Guardia and Groves, and also at Little Sea, Studland, Dorset, by Mr. Mansell Pleydell.—Mr. Geo. Murray showed dried and moistened examples of an Algæ, *Gleocapsa*, found by Mr. Pryer in birds'-nest caves in North Borneo.—Mr. J. G. Baker read the following letter from Mr. W. Brockhurst, of Didsbury, dated November 17, 1884:—"On April 2 I had the pleasure of exhibiting to the Society a number of prepared specimens of the daffodil, which appeared to prove that double daffodil flowers might produce seeds, and I advanced some arguments, based upon the observations I had made, to show that they were spread over wide areas in a wild state of seeding. The specimens showed the seed-vessels filled with ovules, but this did not fully prove that ripe seeds capable of germination would be matured. I therefore carefully observed a number of flowers of double daffodils (*Narcissus telamoneus-plenus*), and marked them as they went out of bloom, to prevent any mistakes. One of these produced a capsule containing nine shining black seeds, which were gathered on June 24, and at once sowed in a pot, and covered with a sheet of glass. Of these seeds four have already germinated, and show grass-like growths an inch above the soil. This therefore completes the proof."—Mr. W. T. Thiselton Dyer pointed out and made remarks on some sterile runners of *Mentha piperita*, and the remains of flowers of *Epilobium hirsutum*, both taken from a wreath found by Prof. Maspero in a tomb near Thebes, and supposed to be of the 20th or 26th dynasty; Mr. Dyer also exhibited fresh flowers of *Ipomea purpureo-cerulea*.—Mr. Thos. Christy exhibited two specimens of *Lycaste Skinneri*, Lindl., one with two flowers on one stem, the other with an aborted lip adherent for the greater part of its length to the column. He also drew attention to samples of the tea (probably a species of *Ilex*) used largely in Bogota, but which is said to be deficient in flavour.—Mr. E. C. Stanford thereafter showed some of the products from seaweed, viz.:—Algin, the insoluble form of which (alginic acid) can be made into shirt-studs resembling horn, &c.; the soluble algin (or alginate of soda), which diminishes the brittleness of shellac, besides other uses.—A paper was read by Mr. E. M. Holmes on *Cinchona Ledgeriana* as a species. The author expressed the opinion that under the name of *C. Ledgeriana*, a number of varieties or forms, and probably some hybrids of *Cinchona Calisaya*, are now under cultivation in the British colonies. He believed that, if more attention were paid to the characters afforded by the bark of trees, taken in conjunction with the other botanical characters of flower and fruit, these varieties and hybrids would be more easily defined and recognised. He considers that the plant published under the name of *C. Ledgeriana* by Dr. Trimen was probably referable to Weddell's *Cinchona Calisaya*, var. *pallida*, as a horticultural form, for which the author proposed the name "*Trimeniana*."—A paper was read, notes on the habits of some Australian Hymenopterous Aculeata, by H. L. Roth. He states that the wasps of the genus *Pelopaeus* (*P. latus*) build their nests on the walls, ceilings, legs of chairs, under the table, in cupboards, vases, between pictures and the walls, on curtains, in all sorts of crevices in the house, and on the roof. No place is safe from their intrusion. When a cell is completed, the wasp goes in search of spiders, and, seizing these, packs their half-dead bodies in the cell, lays an egg, and closes the cell-top; thereafter rows of cells are added to the primary one and dealt with in the same fashion, generally finishing with a streaked coating of mud, thus to deceive as to the real contents beneath. These wasps are infested with Dipterous parasites. Of the Australian ants, *Formica rufinigro* is numerous, bold, and destructive. They destroy the web of certain caterpillars and wriggle them out, when they fall a prey to a host of attendant

warrior ants.—Mr. E. T. Druery read a paper on a singular mode of reproduction in *Athyrium filix-femina*, var. *clarissima*. In a previous paper the author had shown that prothallia-bearing antheridia and archegonia were developed on the apex of pear-shaped bodies with the larger end downwards, in the place usually occupied by sori. In the present paper he brought forward evidence to show that these pear-shaped bodies were not developed from sporangia, but from a previous formation of thread-like bodies, a few of which became thickened, and developed into the pear-shaped bodies previously mentioned, the others remaining starved and undeveloped.

Zoological Society, November 18.—Prof. W. H. Flower, F.R.S., President, in the chair.—A communication was read from Mr. J. G. F. Riedel, C.M.Z.S., containing comments on certain passages in Mr. H. O. Forbes's paper on Timor-Laut birds, read before the Society on June 17.—A communication was read from Mr. H. Pryer, C.M.Z.S., giving an account of a recent visit to the edible-birds'-nest caves of British North Borneo. In illustration of this paper, Mr. Pryer sent specimens of the swift (*Collocalia fuciphaga*), of its nest and eggs, of the *Alga* on which the bird was supposed to feed, and of the bat which inhabited the same caves.—Mr. Sclater read an account of some skins of mammals from Somali-land, which belonged apparently to five species. Amongst these was an apparently new form of wild ass, which was proposed to be called *Equus asinus somalicus*.—Mr. F. E. Beddard read a paper on the anatomy of the Umbrette (*Scopus umbretta*). The author observed that, as regards its exact systematic position, which had been hitherto a matter of doubt, he was inclined to place this peculiar form as a type of a separate family, between the herons (*Ardeidae*) and the storks (*Ciconiidae*).—A second paper by Mr. Beddard contained the results of some recent investigations into the structure of *Echidna*, and related to the presence of a persistent umbilical vein in that animal.—Captain Shelley read a paper on some new or little-known species of East African birds. Three of these were described under the names *Muscicapa johnstoni*, *Pratincola axillaris*, and *Nectarinia kilimensis*. The collection, which contained altogether ninety-four specimens, referable to thirty-eight species, was the first-fruits of Mr. H. H. Johnston's expedition to Kilimanjaro.—A communication was read from Mr. J. H. Gurney, F.Z.S., on the geographical distribution of *Huhua nipalensis*, with remarks on this and other allied species of owls.

Chemical Society, November 20.—Dr. Perkin, F.R.S., in the chair.—The following gentlemen were elected Fellows:—F. Broughton, F. J. Down, L. Ehrmann, F. G. Holmes, J. Hulme, C. Thompson, W. F. Wigley.—The following papers were read:—On some new paraffins, by Khan B. B. Sobrabji. The author has prepared cetane boiling at 278°, dicetyl melting at 70°, ethylcetyl and diheptyl.—On additive and condensation compounds of diketones with ketones, by F. R. Japp and N. H. J. Miller. The authors have studied the action of potash of various strengths on mixtures of phenanthraquinone and acetone. Additive compounds were obtained containing one molecule of the first substance to two of acetone, and another containing two molecules of phenanthraquinone to one of acetone. Condensation compounds were formed from the above additive compounds by the abstraction of the elements of water. The authors have also studied the action of potash upon mixtures of benzil with acetone and with acetophenone respectively, and have obtained acetobenzil and acetophenonebenzil.—On the vapour-pressure of acetic acid, and on a new method of determining the vapour-pressures of liquids, by W. Ramsay and Sydney Young. The authors have used a species of still into which a thermometer dips, the bulb of which is covered with cotton-wool moistened with the liquid. On heating, the liquid evaporates from the cotton-wool without ebullition. Results obtained agree with those obtained in the ordinary way. Perfectly concordant and regular results have been obtained with acetic acid.—On the action of the halogens on the salts of trimethylsulphine, by L. Dobbin and Orme Masson. The authors conclude that all the haloid salts of trimethylsulphine combine directly with chlorine, bromine, iodine, and iodine monochloride. In no case is one halogen replaced by the other. The authors have partly investigated the action of the halogens on trimethylsulphine sulphate.—Note on the heats of dissolution of the sulphates of potassium and lithium, by S. U. Pickering. The salts do not seem to form isomeric modifications such as exist in the case of sodium sulphate.—On the application of iron sulphate in agriculture and its value as a plant food, by A. B. Griffiths. The

author finds that half a hundredweight of sulphate of iron per acre increased the yield of beans from 28 bushels to 44 bushels, of turnips from 13 tons to 16½ tons, but little effect was produced on cereals.—Notes on the chemical alterations in green fodder during its conversion into ensilage, by C. Richardson. The author confirms the results obtained by Kinch and Kellner, that a considerable increase in the non-albuminoid nitrogen takes place in the conversion: no such change occurs during the ordinary drying of fodder. The author used maize in his experiments.—On the decomposition of silver fulminate by hydrochloric acid, by E. Divers and Michitada Kawakita. The authors have studied the action of dilute and strong hydrochloric acid on this salt. With dilute acid the principal products are hydroxyammonium chloride and formic acid; if the acid is strong, much ammonium chloride is produced. A small quantity of hydrocyanic acid is always formed. They could not obtain any oxalic acid by decomposing mercury fulminate with hydrogen sulphide in ether. They have also studied the action of hydrochloric acid on fulminates.

PARIS

Academy of Sciences, November 24.—M. Rolland, President, in the chair.—Experiments with the chlorhydrate of cocaine (continued), by M. Vulpian. Further experiments made on snails (*Helix pomatia*) and fresh-water prawns (*Astacus fluviatilis*, F.) show that this anæsthetic is less efficacious in the case of invertebrate than vertebrate animals.—Note on the algebraic relations between hyperelliptic functions of the n order, by M. Brioschi.—On some reactions of the sulphuret of carbon, and on the solubility of this substance in water, by MM. G. Chancel and F. Parmentier.—Remarks by M. Daubrée on M. Norden-skjöld's "Voyage Round Europe and Asia," in connection with the French translation of that work presented to the Academy.—Note on the action of heat on electric piles, and on the law of Kopp and Woestyne, by M. G. Lippmann.—Statistical note on cholera in the Paris hospitals since the outbreak of the epidemic on November 4 till the present time, by M. Emile Rivière. During this period 971 patients (579 men, 392 women) were treated in the various hospitals. Of these, 511 succumbed (302 men, 209 women), and 239 (129 men, 110 women) have so far been completely cured. The mortality has thus been 52·33 and 53·31 for men and women respectively. The working classes—rag-gatherers, seamstresses, washerwomen, masons, bricklayers, and shoemakers—have supplied the largest relative number of victims. These have almost invariably been persons of feeble constitution, subject to chronic disorders, exhausted by previous excesses, exposed to extreme physical destitution, or dwelling in the lowest slums of the French capital and its suburbs.—Remarks on the second instalment of the new map of Tunis prepared in the War Office on a scale of 1 : 200,000, by Col. Perrier. This instalment comprises six sheets, embracing the districts of Kef, Kairwan, Mahedia, Feriana, El Jem, and Sfax, based on surveys executed on the spot.—Presentation of the "Annals of the Ouro-Preto School of Mines," by the Emperor Dom Pedro II., with remarks by M. Daubrée.—On the condensation of the solar nebula on the hypothesis of Laplace, by M. Maurice Fouché.—Remarks on the nature of the curve known as Poinsof's erpolodie, by M. de Sparre.—On the involution of superior dimensions, by MM. J. S. and M. N. Vanecsek.—Dynamo-electric machines: experimental confirmations of the two reactions, on the effective values of the inner resistance and of the inductor magnetism, by M. G. Cabanellas.—Action of water on the double salts, by M. F. M. Raoult.—On the composition of the gaseous products resulting from the combustion of pyrite, by M. Scheurer-Kestner.—New experiments on the rotation of crops in connection with the cultivation of beetroot, by M. P. P. Dehérain.—On the appearance and spread in France of the parasite of the beetroot known as *Heterodora schachtii*, by M. Aimé Girard. To this parasite, the author thinks, is largely due the partial failure of this year's crop, which showed a deficit of 20 per cent. in the weight of the roots, besides a decrease in the yield of saccharine, which in some of the northern districts amounted to 12 or 14 per cent.—On the formation of vegetable acids in combination with potassa and lime bases, on the nitric substances and the nitrate of potassa developed in the saccharine plants, beetroot and maize, by M. H. Lèplay.—On the characteristic smell and effects of the products of fermentation produced by the comma-bacillus of cholera, by MM. W. Nicati and M. Rietsch.—On

cholera and cholemia, by M. W. Nicati. From the experiments recently made in the chemical laboratory of the Faculty of Sciences at Marseilles it seems established that biliary acids are relatively more abundant in the blood of the victims of cholera than in others. But the author is unable yet to decide whether in their case death is to be attributed to cholemia.—Note on infectious and parasitic pneumonic affections, by M. Germain Sée.—Experiments on the efficacy of disinfecting agents in the case of chicken cholera, by M. Colin.—On the virulence of the bubo accompanying soft chancre, by M. I. Straus.—On the luminous intensity of the spectral colours; influence of the state of the retina in determining light effects, by M. H. Parinaud.—On the appendices to the jaw of grinding insects, by M. Joannes Chatin.—On the floral polymorphism and the fertilisation of *Lychnis dioica*, L., by M. L. Crié.—Remarks on Dr. Ladislas Szajnoch's memoir on the Cephalopods of the Elobi Islands, West Coast of Africa, by M. Daubrée.

BERLIN

Meteorological Society, November 4.—Dr. Hellmann, following up an account of the most recent works in the department of meteorological literature, which he concluded with a full discussion of Mr. Blanford's rain-map of India, communicated his own observations regarding the rain conditions prevailing in Heligoland. The measurements there obtained had given an annual rainfall of 72.50 inches, an amount far surpassing that which had been observed at any of the neighbouring stations on the west coast of Schleswig and at the mouth of the Elbe. The speaker, having last summer made a tour of inspection, and convinced himself, from the instruments in use and their situation, of the accuracy of the registrations above referred to, explained the excessive rainfall in Heligoland by the circumstance that the steep coast, shooting up almost perpendicularly to about 164 feet above the level of the sea, forced the moist sea winds suddenly aloft, and so caused them to cool and condense both very rapidly and to a great extent. For the sake of testing the correctness of this explanation he had got another rain-gauge set up on the dunes at about 16 feet above sea-level, the registrations of which would next year be compared with those at the higher level. A second point in which the rain conditions of Heligoland deviated from those observed at the neighbouring stations on the coast respected the annual course of the rainfall. It was found that in North-West Germany the rainfall indicated a minimum in the middle of April and a maximum in August. In Heligoland, on the other hand, though indeed the minimum of rainfall occurred likewise in the middle of April, the maximum was attained in November. Dr. Hellmann sought an explanation of the postponement of the rain maximum in this latter case in the circumstance that in the yearly course of the temperature of the water and the atmosphere the difference between the two was greatest in November, the water at that time showing a temperature as much as 3°·6 F. warmer than that of the air.—Prof. Spörer gave a brief sketch of the present period of sun-spots. The spot periods being counted from minimum to minimum, the commencement of the present spot period was to be referred to 1878·8. So far as had been hitherto observed the present was distinguished from the two last spot periods by two peculiarities; first, that the maximum in the present period appeared to have occurred 0·4 of a year later than in the previous periods, and, second, that during the maximum the distribution of the solar eruptions showed an essentially different character from that usually obtaining. In the former periods it was observed during the maximum that the greatest concourse of spots surrounded with faculæ occurred in the median latitudes of the sun, that they were completely wanting towards the poles, became less numerous also towards the equator, and only at the equator itself did they again become somewhat more crowded. In the rotation of the sun those eruptions showed a heliographic displacement towards the equator, in contrast to the spots free from faculæ which, in the course of rotation, wandered towards the poles. During the minima of the spot periods the maximum of the eruptions was generally found in the neighbourhood of the equator. In the present period, again, the greatest concourse of eruptions surrounded with faculæ was found towards the equator during the maximum as well, a phenomenon usually occurring at the time of the minimum. The present, on the other hand, resembled former periods in the circumstance that it was only on rare occasions that the concourse of spots was alike on both hemispheres of the sun. In

the majority of cases either the northern hemisphere presented a more copious display of spots than the southern, or the southern mustered them in larger numbers than the northern.

STOCKHOLM

Academy of Sciences, November 12.—Prof. Gylden communicated the results of the Meridian Conference in Washington, according to the report of the Swedish delegate Count Lewenhaupt, and gave an account of his own paper "On the origin of comets."—Prof. Lindström exhibited a fossil scorpion recently found near Wisby in the Silurian formation of Gotland, and remarkable as the most ancient air-breathing land-animal at present discovered.—Prof. Retzius presented the last volume of his great work "Das Gehörorgan der Wirbelthiere," and made some remarks on its contents.—Prof. Nordenskjöld communicated a "Catalogue of the Meteorites in the Swedish Museum of Natural History," by Herr G. Lindström, Assistant Mineral Department.—Prof. Wittrock gave an account (1) of a paper by Dr. Johansson, of Upsala, "On Fungi from Iceland," and (2) of another paper by Dr. Alb. Nilsson "On the mechanical function of the sheaths of *Dianthus banaticus*, Heuff."—The Secretary presented the following papers:—On a quantity of the electrical potential, by Prof. Dahlander.—Sur la sommation des puissances semblables des n premiers nombres entiers, by Dr. C. O. Boije, of Gennäs.—On some recently-published mathematical papers from the seventeenth century by Bierens de Haan, by Dr. G. Eneström.—On a proposition from the theory of the elliptic functions, by E. Phragmén.—On substituted cyanamides and melanins, by Dr. P. Claësson.—On *Mergus anatarius*, Eimbeck, found in Sweden, by G. Kolthoff.—On a new Isopod from the coast of Sweden, by Dr. C. Bowallius.—On minerals occurring at Vestra Silfberg, by Dr. Mats Weibull.—A catalogue of the phenogamous plants and ferns of Jemtland, by Dr. P. Olsson.

VIENNA

Imperial Academy of Sciences, October 23.—Report on his journeys in the Balkan Peninsula, by F. Toula.—The geological exploration of the Central Balkans and adjacent regions, by the same.

CONTENTS

PAGE

| | |
|------------------------------------------------------------------------------------------------------|-----|
| The Cholera Bacillus | 97 |
| The Haytian Negroes. By Prof. A. H. Keane | 98 |
| Our Book Shelf:— | |
| Johow's "Hilfsbuch für den Schiffbau" | 100 |
| Carr's "Synopsis of Elementary Results in Pure and Applied Mathematics" | 100 |
| Letters to the Editor:— | |
| Natural Science for Schools.—Walter A. Watts | 101 |
| Do Flying-Fish Fly?—Dr. John Rae, F.R.S. | 101 |
| The <i>Jeannette</i> Drift.—R. S. Newall | 102 |
| A Meteor Visible in the Daytime.—Rev. James Graves | 102 |
| Noon-Glow.—D. J. Rowan | 102 |
| Rosy Glow about the Moon.—Robert Leslie | 102 |
| Wild Fowl Decoy.—Sir Ralph Payne Galloway, Bart. | 102 |
| Prehistoric Man.—Daniel Pidgeon | 102 |
| Fly-Maggots Feeding on Caterpillars.—J. H. A. Jenner; M. E. S. | 103 |
| The Forbes Memorial.—Prof. F. Jeffrey Bell | 103 |
| Thomas Wright, M.D., F.R.S. | 103 |
| Robert A. C. Godwin-Austen, F.R.S. | 104 |
| Charles Clouston | 104 |
| On the Autumnal Tints of Foliage. By H. C. Sorby | 105 |
| A Tornado Photographed. By Prof. Edward S. Holden. (<i>Illustrated</i>) | 106 |
| Meteorology of Magdeburg | 106 |
| On a Hydriform Phase of "Lymnocodium Sowerbii." By Alfred Gibbs Bourne | 107 |
| Notes | 107 |
| The Royal Society Anniversary | 109 |
| The Wave Theory of Light, II. By Sir William Thomson, F.R.S., LL.D. (<i>Illustrated</i>) | 115 |
| Scientific Serials | 118 |
| Societies and Academies | 118 |